CLAIMS

What is claimed is:

1. A parser program to parse mathematical optimization problems, wherein a geometric program is converted from a set of algebraic expressions to a compact numeric format that can be accepted by a computer-based geometric program solver.

2. The parser of claim 1, wherein said geometric program is comprised of an objective and a set of one or more constraints.

3. The parser in claim 2, wherein:

said objective includes an expression of one or more mathematical terms; and

each constraint in said set includes either an inequality or equality of one or more mathematical terms.

4. The parser in claim 3, wherein:

each mathematical term includes one or more optimization variables.

5. A computer-implemented method of parsing a mathematical optimization problem comprising:

reading a plurality of algebraic expressions that represent a mathematical optimization problem, each algebraic expression in said plurality having one or more mathematical terms;

creating a set of signomial expressions by converting each of said mathematical terms to a signomial; and

converting said set of signomial expressions to a compact numeric format to be accepted by a computer-based geometric program solver.

6. The method of Claim 5, wherein said algebraic expressions include an objective and a set of one or more constraints.

7. The method in claim 6, wherein:

said objective includes an expression of one or more mathematical terms; and

each constraint in said set includes either an inequality or equality of one or more mathematical terms.

8. The method in claim 7, wherein:

each mathematical term includes one or more optimization variables.

9. The method of Claim 5, further comprising:

prior to said converting, determining that all signomial expressions in said set reduce to either a posynomial objective, a posynomial inequality or a monomial inequality;

after said determining, identifying that said mathematical optimization problem is a geometric program.

10. The method of Claim 5, further comprising:

prior to said converting, determining that at least one of said signomial expressions in said set cannot be reduced to either a posynomial objective, a posynomial inequality or a monomial inequality;

after said determining, reporting to a user which of said signomial expressions in said set cannot be reduced to either a posynomial objective, a posynomial inequality or a monomial inequality.

11. The method of Claim 10, further comprising the step of:

simplifying each signomial expression in said set by mathematically canceling a combination of a plurality of said signomials.

12. A computer-implemented method of parsing a mathematical optimization problem comprising:

reading a plurality of algebraic expressions that represent a mathematical optimization problem, each algebraic expression in said plurality having one or more mathematical terms;

identifying that said algebraic expressions form a geometric program; and

converting said plurality of algebraic expressions to a compact numeric format to be accepted by a computer-aided geometric program solver.

13. The method of Claim 12, wherein said algebraic expressions include an objective and a set of one or more constraints.

14. The method in claim 13 wherein:

said objective includes an expression of one or more mathematical terms; and

each constraint in said set includes either an inequality or equality of one or more mathematical terms.

15. The method in claim 14, wherein:

each mathematical term includes one or more optimization variables.

16. The method of claim 12, further comprising:

prior to said identifying, creating a set of signomial expressions by converting each of said mathematical terms to a signomial; and

after said creating, determining that all signomial expressions in said set reduce to either a posynomial objective, a posynomial inequality or a monomial inequality.

17. The method of Claim 16, further comprising:

prior to said identifying, determining for each algebraic expression in said plurality that a mathematical combination of said mathematical terms form either a posynomial objective, a posynomial inequality or a monomial inequality.

18. A computer-readable medium for parsing a geometric program comprising:

a user interface to accept a plurality of algebraic expressions that represent a mathematical optimization problem, each algebraic expression in said plurality having one or more mathematical terms;

an expression verifier coupled to said user interface to identify that said algebraic expressions form a geometric program; and

a matrix generator coupled to said to expression verifier to convert said plurality of algebraic expressions to a compact numeric format to be accepted by a computer-aided geometric program solver.

19. The computer-readable medium of Claim 18, wherein said algebraic expressions include an objective and a set of one or more constraints.

20. The computer-readable medium in claim 19, wherein:

said objective includes an expression of one or more mathematical terms; and

each constraint in said set includes either an inequality or equality of one or more mathematical terms.

21. The computer-readable medium in claim 20, wherein:

each mathematical term includes one or more optimization variables.

22. The computer-readable medium of Claim 18, further comprising:

an expression reducer to simplify each algebraic expression of said plurality by mathematically canceling a combination of a plurality of said mathematical terms.

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